



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

MS

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,985	12/18/2001	Quanyuan Shang	AMAT/5162/DISPLAY/AKT/BG	4811
32588	7590	02/19/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			CROWELL, ANNA M	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 02/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,985

Applicant(s)

SHANG ET AL.

Examiner

Michelle Crowell

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 22-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-37 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 04/02, 05/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-21, drawn to an apparatus, classified in class 118, subclass 723R.
 - II. Claims 22-37, drawn to a method, classified in class 427, subclass 569.
2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process, such as etching.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Mr. Todd Patterson on January 21, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-21. Affirmation of this election must be made by applicant in replying to this Office action. Claims 22-37 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Art Unit: 1763

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

6. Portions of the information disclosure statement filed April 9, 2002 and May 30, 2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been listed in the application file, but the information referred to therein has not been considered. In the IDS of 04-09-02, copies of the foreign patent documents and the other art are omitted. In the IDS of 05-30-02 under other art, a copy of the Lee et al. reference (C24) is omitted.

Specification

7. The disclosure is objected to because of the following informalities: On page 7, line 6, the term "restive" is misspelled. The correct spelling is "resistive".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 1763

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 2 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claims 2 and 13 recite the limitation "the gas dispersion plate" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 5, 6, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuda et al. (Japanese Patent Publication 08-181113A).

Referring to Drawing 1 and paragraphs [0009]-[0017], Matsuda et al. discloses an apparatus for material deposition on a substrate, comprising: a chamber 1; a process gas distribution assembly within the chamber (par. [0009]); a power source 9 coupled to the chamber for establishing a plasma (par. [0013]); and a movable substrate support member 3, 8 within the chamber having a support surface thereon and a thermally insulating layer 5 on the support surface to support a substrate 6 thereon (par. [0012], [0017]).

With respect to claim 5, the apparatus includes the insulating layer 5 is formed on the support surface 3 (Drawing 1 and 9, par. [0011]).

Art Unit: 1763

With respect to claims 6 and 15, the apparatus includes the insulating layer being selected from the group of insulators (par. [0011]).

With respect to claim 10, the apparatus further includes a frame 13 to hold the insulating layer on the supporting surface of the support member (Drawing 1).

With respect to claim 12, the apparatus further includes a frame 13 disposed on the thermally insulating layer 5 that when raised by the movable substrate support to a processing position is electrically insulated from the chamber.

With respect to claim 17, the frame 13 when placed in a processing position is positioned proximate the chamber sidewalls 1 to minimize plasma leakage between the sidewalls and the frame during processing (Drawing 1).

With respect to claim 18, the frame 13 is positioned adjacent a plurality of chamber sidewalls such that a gap is formed to prevent arcing between the frame and the chamber sidewalls (Drawing 1).

13. Claims 1, 3-7, 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Kurono et al. (U.S. 5,779,803).

Referring to Figure 1 and column 3, lines 8-65, Kurono et al. discloses an apparatus for material deposition on a substrate, comprising: a chamber 2 (col. 3, lines 8-11); a process gas distribution assembly 27 within the chamber (col. 4, lines 49-60); a power source 31 coupled to the chamber for establishing a plasma (col. 3, lines 59-61); and a movable substrate support member 4 within the chamber having a support surface thereon and a thermally insulating layer

Art Unit: 1763

42 and 43 on the support surface to support a substrate W thereon (col. 3, lines 11-20, lines 36-38).

With respect to claim 3, the apparatus includes a substrate support member 4 comprising a heater 8 (Fig. 1, col. 3, lines 25-27).

With respect to claim 4, the apparatus includes the insulating layer comprising at least a first sheet 42 and a second sheet 43 bonded together to form a unified body (Fig. 2).

With respect to claim 5, the apparatus includes the insulating layer 42 is formed on the support surface 4 (Fig. 2).

With respect to claim 6, the apparatus includes the insulating layer being selected from the group of insulators (col. 3, lines 36-38).

With respect to claim 7, the apparatus includes an insulating layer is a polymer (col. 3, lines 36-38).

With respect to claim 10, the apparatus further includes a frame 21 and 22 to hold the insulating layer on the supporting surface of the support member (Fig. 1).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1763

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of Moslehi et al. (US 5,796,261).

The teachings of Matsuda et al. have been discussed above.

Matsuda et al. fails to teach a gas dispersion plate with a heat reflective surface.

Referring to column 6, lines 26-32, Moslehi teaches a gas dispersion plate 30 with a heat reflective surface, since a reflective surface eliminates pattern effects on temperature uniformity. In addition, it is well known in the art to use a gas dispersion plate to uniformly distribute process gases. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Matsuda et al. with the gas dispersion plate 30 with a reflective surface in order to eliminate pattern effects on temperature uniformity and uniformly distribute process gases.

17. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of Kurono et al. (US 5,779,803).

The teachings of Matsuda et al. have been discussed above.

Art Unit: 1763

Matsuda et al. fails to teach a heater.

Referring to column 3, lines 25-30, Kurono et al. teaches it is well known to include a heater 8 in a substrate support member 4 in order to achieve the desired temperature to yield optimum processing conditions. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate support member of Matsuda et al. with a heater as taught by Kurono et al. since this would achieve the desired temperature to yield optimum processing conditions.

18. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A).

Matsuda et al. fails to teach that the insulating layer comprises at least a first sheet and a second sheet bonded together to form a unified body; however, it is obvious to bond multiple sheets to form a unified body since this would generate a more durable insulating layer. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the insulating layer of Matsuda et al. to include a first sheet and a second sheet bonded together to form a unified body since this would generate a more durable insulating layer.

19. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of Arai et al. (U.S. 5,203,958).

The teachings of Matsuda et al. have been discussed above.

Matsuda et al. fails to teach the insulating layer is selected from the group of ceramic, glass, polymer, and combinations thereof.

Art Unit: 1763

Referring to column 3, lines 30-46, Arai et al. teaches an insulating layer 5 made of a polymer in order to make constant the impedance between the substrate 6 and the substrate support member 2. Additionally, polymers, ceramics, and glass are well known insulating materials used in plasma processing. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the insulating layer of Matsuda et al. to be a polymer, ceramic, or glass as taught by Arai et al. in order to make constant the impedance between the wafer and the substrate support member and since polymers, ceramics, and glass are well known insulating materials used in plasma processing.

Matsuda et al. fails to teach the insulating layer is adhesively bonded to the support surface.

Referring to column 3, lines 30-35, Arai et al. teaches an insulating layer 5 which is adhesively bonded to the support surface 2. Adhesive bonding is a known method for adhering and securing the insulating layer to the support surface. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to adhesively bond the insulating layer to the support surface of Matsuda et al. as taught by Arai et al. since this is a known method of adhering and securing an insulating layer to a support surface.

20. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of Tsubone et al. (U.S. 5,673,750).

The teachings of Matsuda et al. have been discussed above.

Matsuda et al. fails to teach the frame base adapted to contact the insulating layer.

Referring to Figure 1 and column 3, lines 48-50, Tsubone et al. teaches a processing

Art Unit: 1763

apparatus wherein the frame base 8 is adapted to contact the insulating layer 7 to cover the insulating layer and prevent deterioration from plasma. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the frame base of Matsuda et al. to be adapted to contact the insulating layer as taught by Tsubone in order to cover the insulating layer and prevent deterioration from plasma.

21. Claims 12, 14, 15, 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of White et al. (U.S. 5,352,294).

The teachings of Matsuda et al. have been discussed above.

Matsuda et al. fails to teach a frame raised by the movable substrate support.

Referring to Figures 3 and 10, and column 5, lines 55-67, White et al. teaches a processing apparatus wherein a frame 40 is raised by the movable substrate support 113 (col. 4, lines 15-21). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to raise the frame of Matsuda et al. with the movable substrate support as taught by White et al. since integrating the function of raising the frame and the substrate support is merely a matter of obvious engineering design choice which would reduce the apparatus' footprint.

Matsuda et al. fails to teach a heater.

Referring to column 4, lines 15-17, White et al. teaches it is well known to include a heater in a substrate support member 4 in order to achieve the desired temperature to yield optimum processing conditions. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate support member of Matsuda et al. with a

Art Unit: 1763

heater as taught by White et al. since this would achieve the desired temperature to yield optimum processing conditions.

22. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of White et al. (U.S. 5,352,294) as applied to claims 12, 15, 17, and 18 above, and further in view of Moslehi et al. (US 5,796,261).

The teachings of Matsuda et al. in view of White et al. have been discussed above.

Matsuda et al. in view of White et al. fail to teach a gas dispersion plate with a heat reflective surface.

Referring to column 6, lines 26-32, Moslehi et al. teaches a gas dispersion plate 30 with a heat reflective surface, since a reflective surface eliminates pattern effects on temperature uniformity. In addition, it is well known in the art to use a gas dispersion plate to uniformly distribute process gases. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Matsuda et al. in view of White et al. with the gas dispersion plate with a reflective surface of Moslehi et al. in order to eliminate pattern effects on temperature uniformity and uniformly distribute process gases.

23. Claim 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of White et al. (U.S. 5,352,294) as applied to claims 12, 15, 17, and 18 above, and further in view of Arai et al. (U.S. 5,203,958).

The teachings of Matsuda et al. in view of White et al. have been discussed above.

Art Unit: 1763

Matsuda et al. in view of White et al. fail to teach the insulating layer is selected from the group of ceramic, glass, polymer, and combinations thereof.

Matsuda et al. fails to teach Referring to column 3, lines 30-46, Arai et al. teaches an insulating layer 5 made of a polymer in order to make constant the impedance between the substrate 6 and the substrate support member 2. Additionally, polymers, ceramics, and glass are well known insulating materials used in plasma processing. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the insulating layer of Matsuda et al. in view of White et al. to be a polymer, ceramic, or glass as taught by Arai et al. in order to make constant the impedance between the wafer and the substrate support member and since polymers, ceramics, and glass are well known insulating materials used in plasma processing.

24. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (Japanese Patent Publication 08-181113A) in view of White et al. (U.S. 5,352,294) as applied to claims 12, 15, 17, and 18 above, and further in view of Tsubone et al. (U.S. 5,673,750).

The teachings of Matsuda et al. in view of White et al. have been discussed above.

Matsuda et al. in view of White et al. fail to teach a frame base adapted to contact the insulating layer.

Referring to Figure 1 and column 3, lines 48-50, Tsubone et al. teaches a processing apparatus wherein the frame base 8 is adapted to contact the insulating layer 7 to cover the insulating layer and prevent deterioration from plasma. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the frame base of Matsuda et al. in view

Art Unit: 1763

of White et al. to be adapted to contact the insulating layer as taught by Tsubone in order to cover the insulating layer and prevent deterioration from plasma.

Double Patenting

25. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

26. Applicant is advised that should claims 15 and 16 be found allowable, claims 20 and 21 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Conclusion

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fujita '895 teaches a processing apparatus having a support with an insulating layer and a frame. Sasamura et al. '856, Koshimizu '360, and Kubota et al. '495 teach a processing apparatus having a movable support with an insulating layer.

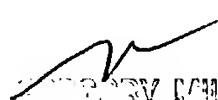
Art Unit: 1763

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571) 272-1432. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMC *ame*


GREGORY MILLS
SENIOR PATENT EXAMINER
TECHNOLOGY CENTER 1700